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# SQUAB RAISING



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Squabs are raised throughout the entire United States. Many producers sell their squabs directly to consumers such as hospitals, hotels, country clubs, and high-class restaurants. Others sell directly to wholesalers in large cities.

As an indication of the size of this industry, the estimated annual volume of squabs sold through the combined terminal markets of Chicago, Detroit, New York, San Francisco, and St. Louis is approximately 1 million pounds.

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## PRECAUTIONS

Pesticides and bactericides used improperly may cause injury to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Keep pesticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and animals cannot reach them.

When handling a pesticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of pesticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of pesticide dusts or mists.

Avoid spilling pesticide concentrate on your skin, and keep it out of your eyes, nose, and mouth. If you spill any on your skin, wash it off immediately with

soap and water. If you spill it on your clothing, launder the clothing before wearing it again.

After handling a pesticide, do not eat, drink, or smoke until you have washed your hands and face. Wash any exposed skin immediately after applying a pesticide.

Avoid drift of pesticide to nearby wildlife habitats, bee yards, crops, or livestock.

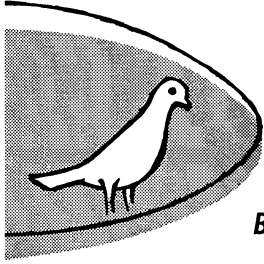
To protect water resources, fish, and wildlife, do not contaminate lakes, streams, or ponds with pesticide. Do not clean spraying equipment or dump excess spray material near such water.

Dispose of empty pesticide containers at a sanitary land-fill dump, or crush and bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies. If you have trash-collection service, wrap small containers in heavy layers of newspapers and place them in the trash can.



Washington, D.C.

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# SQUAB RAISING

*By specialists of the Poultry Research Branch, Animal Husbandry  
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A squab is a young pigeon usually marketed at 25 to 30 days of age just before it is ready to leave the nest. It then weighs from 12 to 24 ounces.

Pigeons of high quality are raised for market in all parts of the United States. Large plants have been

developed for this purpose in the Northeastern and Southeastern States, on the Pacific Coast, and near a few of the larger midwestern cities. Squabs are being raised as a sideline in villages, towns, and on farms.

## Possibilities in Squab Raising

Squabs can be made a profitable source of income with good management and a good market. Squab production requires little land since all breeders are kept in small pens and houses. Prices received for squabs are usually high enough to return a fair profit when there is a good demand.

The average annual return, above feed cost, varies with prices and with management, but it can be estimated by using local prices. Allow an annual production of from 10 to 14 squabs for each pair of breeders, and a feed consumption of from 90 to 110 pounds per pair. Feed consumption varies with the size of the breed and number of squabs produced.

Additional income may often be obtained from the sale of breeding

stock, especially from high-producing flocks. As a hobby, squab raising furnishes an opportunity for diversion as well as a means of supplying choice tender meat for home consumption.

There is a fair demand for squabs in large cities, where they are often used in place of game fowl. The flesh of squab contains a larger proportion of soluble protein and a smaller proportion of connective tissue than pigeon flesh; it is a good source of liquid protoplasm and of riboflavin and is relatively rich in phosphorus. Squab meat has a fine texture and a distinct delicious flavor, is tender and easily digested, and is widely recommended by physicians for invalids and convalescents. A squab also is of desirable size for an individual serving.

## Breeds Suitable for Squab Raising

There are a great many breeds of pigeons. Only those used extensively for the production of squabs for market are described in this bulletin. These pigeons are selected primarily as prolific producers of good-sized squabs, with minor consideration given to type and color. The best breed to use depends somewhat on the market, but the greatest demand is for the breeds that produce good-sized squabs with light-colored skin. The King, Carneau, Giant Homer, and Mondaine are good producers of squabs of this type. Carefully selected stock of these breeds should produce from 10 to 14 squabs per pair per year, which usually weigh from 14 to 24 ounces live weight, according to the size of the breeds, at 26 to 28 days of age. Crosses of these and other breeds are also used for squab production.

### King

The King is a prolific producer of large, full-breasted squabs and is one of the most popular breeds. The standard weight of old birds is 26 to 30 ounces, that of young birds 24 to 28 ounces. The King is a tight-feathered breed and has a short and blocky body with a deep well-rounded keel and a very broad breast.

The carriage should be erect, with the tail carried horizontally (fig. 1). The head should be moderately large with a round skull and a pinkish white skin; the neck should be moderately stout. Some well-bred flocks of Kings produce from 12 to 15 squabs per pair a year, ranging in live weight from 16 to 24 ounces.

The White King, which is the most popular variety, was produced in the United States about 1891 by crossing the white varieties of the Runt, Homer, Maltese, and Duchess. The plumage is white throughout all sections and should be tight and close fitting.

The Silver King originated much later than the White King, the Mondaine being used instead of the Duchess in producing this variety. It has light skin color and is a popular variety for squab production, but is not bred so extensively as the White King. Other varieties of Kings include the Blue, the Red, the Yellow, and the Dun, these varieties being kept largely for exhibition purposes. The different varieties of the King are similar in size and type, and they differ chiefly in color and in head points.



77495-B

FIGURE 1.—White King female. The White King is a very popular variety for the production of large, full-breasted squabs.

### Carneau

The Carneau originated in the northern part of France and was not brought to the United States until about 1900. It is a popular breed and produces squabs that are slightly smaller than those of the King. Differences in squab weights vary with the relative weights of the mature birds in each breed. The preferred weights for this breed are: Old cock, 23 to 26 ounces; old hen and young cock, 22 to 25 ounces; young hen, 21 to 25 ounces.



8342-B

FIGURE 2.—Red Carneau male. The Red Carneau is another popular squab producer.

The Carneau should be close-feathered. The body is compact, solid, and broad-breasted; the carriage is erect and free from squattness, with the tail just clearing the ground. The wings and tail are moderately short but slightly longer than those of the King. The head is of moderate size, broad between the eyes, with a pronounced rounding of the top of the skull.

The Red and the White are the most popular varieties of this breed, the latter having increased rapidly in popularity as a squab producer in recent years. The plumage of the Red Carneau should be a deep chestnut red throughout (fig. 2), with the color penetrating well into the undercolor. The plumage of the White variety should be white in all sections. Other varieties of the Carneau include the Yellow, the Black, and the Dun, but these varieties are not commonly used for commercial squab production.

### Swiss Mondaine

The Swiss Mondaine was developed in the United States from various breeds, including the White Runt and some of the continental Mondains. There is no native

breed of this type in Switzerland, nor did the breed originate there, as the name implies. The Swiss Mondaine is popular for squab production and produces large squabs. The minimum weights are: Old cock, 32 ounces; old hen, 30 ounces; and young birds of either sex, 28 ounces. There are no maximum weight limitations.

This breed has a large, deep, broad body, is longer than the King, and not as cobby, and carries its tail much lower. The head is moderately large, with a round skull and a prominent forehead. It is a close-feathered breed and has clean legs. The plumage of the White Swiss Mondaine, which is the only standard variety, is white in every section (fig. 3).

### French Mondain

The French Mondain, a newer breed than the Swiss Mondaine, is a large pigeon. It produces large squabs. Standard weights are: Old cock, 28 to 32 ounces; old hen, 26 to 30 ounces; young cock, 27 to 30 ounces; young hen, 25 to 28 ounces.

This breed is not frequently used for commercial squab production.



50337-B

FIGURE 3.—White Swiss Mondaine male. The White Swiss Mondaine is a good squab producer but not so popular as the King.



50334-B

FIGURE 4.—French Mondain male. The Mondains are the largest pigeons used for commercial squab production.

The French Mondain is shaped much like the King and has a large, blocky body that is especially deep and broad-breasted, with moderately short keel. White, Red, Yellow, Black, Dun, Blue, Silver, Checker, Almond, and Splashed varieties occur. The White variety is the most popular for market squab production (fig. 4).

### Homer

The Giant Homer is the only type of Homer that produces fairly good-sized squabs and is the one recommended for squab production. It is probably the most prolific breeder as well as the best feeder of all breeds of pigeons. Giant Homers are smaller than Kings and produce smaller squabs. For some kinds of trade these smaller plump squabs are preferred. The type desired for squab production has a broad, deep breast, is slightly longer and not so compact and blocky as the King. Desired weights for a young or old cock are 24 to 27 ounces, and for a young or old hen, 22 to 25 ounces. All Homers are noted for their close, tight feathering.

This breed is of various colors, of which the blue and the white are

the most popular, but very little attention has been given to color selection in Giant Homers. The standard color of the Blue Homer is a light grayish blue with much darker colored feathers in the head, neck, tail, and ends of the wings (fig. 5).

Small-type homing pigeons, usually referred to as squabbing or working Homers, have been used extensively for commercial squab production and are still kept on many squab farms. They produce a dressed squab weighing only 9 to 10 pounds to the dozen. Special attention should be given to selecting breeders with white skin as Homers have a tendency toward dark skin, which is objectionable in market squabs. Other types of Homers include the racing, the exhibition, and the show Homer.

### Other breeds

Other breeds kept to some extent for squab production include the Runt, the Hungarian, and the Maltese. Crosses of various breeds are also used for squab production. The Hungarian and the Maltese have long legs and necks, high tails,



68185-B

FIGURE 5.—Giant Homer male. The larger types of Homers are good producers of 12- to 16-ounce squabs.

and short solid bodies, and have been crossed with other breeds to produce squabs with very plump breasts. There are several varieties of the Hungarian, of which the Black Hungarian (fig. 6) is the most popular.

The Runt is of Spanish origin; it is the largest domestic pigeon and one of the oldest breeds. It has a large frame with good depth, width, and length and many of the cocks weigh over 3 pounds. This breed produces very large squabs weighing 3 to 4 pounds per pair but it is a slow breeder and is not well adapted for commercial squab production. There are many colors in this breed, the White Runt being the most common.



18722-B

FIGURE 6.—Black Hungarian male. The Black Hungarian is a fair squab producer but is bred largely for exhibition.

### Mating

Pigeons mate in pairs and usually remain with their original mates for life. Only mated birds should be allowed in a pen, because odd birds, especially males, create a lot of disturbance by fighting and breaking up nests of working pairs. A fish net with a short handle is very useful in catching pigeons.

It is difficult to distinguish sexes until the birds are several months old and about ready to mate, when the male will drive the hen. The female is usually somewhat smaller and more refined than the male, especially in the head and neck. The male is more aggressive, struts about with a louder cooing, and often drags his tail on the ground; the female rarely struts and usually holds her body more horizontally than the male. The pelvic bones, which are close together in the male, are spread further apart in the female, especially after she begins to lay. The female also has a tendency to waddle when walking and usually holds her tail higher than the male.

Two methods of mating may be practiced: Natural and forced, either of which will give good results. In natural mating the unmated birds are kept in a pen and allowed to select their own mates. That they have done so is indicated by the male billing with and driving the female. Then the pair is banded with colored leg bands having the same number, provided their nest bands show that they are not too closely related. Forced matings are made by confining the desired male and female in a compartment with feed and water for 10 days to 2 weeks. Then when the pair is well mated the birds are banded with duplicate numbered bands and placed in the breeding pen. The nest boxes may be closed by placing wire frames across the fronts so as to be used for mating coops.

After a pen is filled with mated birds it is best not to disturb them by making changes unless one is obliged to do so, as new birds are likely to fight and may break up the nests of the other pairs. In some cases it may be advisable to break up matings and remate certain birds; for instance, to mate younger male birds with older, high-producing females.



## Selecting Breeders

One of the essentials of success in squab raising is good breeding stock. It is advisable to buy pigeons from good breeders who keep accurate records of the production and weights of their squabs and are willing to guarantee both the age and sex of their stock. It is difficult for the buyer to determine either the age or the sex of pigeons, and many failures in squab raising have been due to the prospective producer's obtaining old pigeons which are past their period of usefulness or to his having a surplus of male birds.

Successful squab producers usually purchase young pigeons nearly ready to begin breeding, or young mated pairs. Breeds kept for squab production usually are mated at from 5 to 8 months of age—Homers at about 5 to 6 months, Kings and Mondaines at 6 to 7 months, and Runts at 8 months. Best results are obtained if the young birds are not allowed to breed until they are of good size and well-matured. Squabs hatched in February, March, April, and May make good breeders and market prices for squabs usually are low in the spring months.

Good stock usually will produce well for 3 to 4 years. The birds should produce well their first year after the newly mated pairs are well settled and selected pairs should continue to produce well during the second and third years. In experiments conducted at the Agricultural Research Center, Beltsville, Md., pigeons gave the highest production during the second year. Egg production of selected birds was good for 5 years; but squab production was slightly lower the third year, considerably down the fourth year, and greatly reduced the fifth year. Squabs should be saved

from the best breeders each year to replace poor producers, old stock, and birds that die. Annual replacements should not exceed 20 percent of the flock since most of the breeders should be kept for 3 years and many of them 5 years or more. A surplus of about 10 percent should be raised to ensure a sufficient number of each sex for desired matings.

Careful selection of the breeding stock and constant culling are essential in building up a profitable flock of squab producers. Good breeders should produce annually 10 to 14 or more market squabs per pair, weighing from 12 to 24 ounces each, live weight, depending on the breed. Pigeons that are poor producers or those that are small or unthrifty should be culled. Producers of market squabs select breeders principally on number and weight of squabs produced and give very little attention to the color or type of the birds. Selection should be made of high-producing pigeons that produce squabs of good weight, that live well, mature quickly, and are of good market quality. Breeding stock may be selected on the basis of their production records, their pedigrees, or the testing of their progeny. Progeny testing, which is the best method of determining the value of breeding stock, has been used but little in breeding pigeons.

Fertility is usually very good in pigeons but heavy losses occur from other causes in many pigeon flocks between the laying of the eggs and the marketing of the squabs. Unusually large birds in the flock are not likely to be good breeders. They are more apt to break eggs in the nest, usually are less prolific, and are not as good feeders as the birds of average weight.

## Methods of Breeding

Close inbreeding is not a desirable practice for the average squab raiser producing birds for market and should be practiced only by well-informed and skillful breeders. Inbreeding, however, tends to fix desirable as well as undesirable characters, and is therefore a means of either great improvement or marked deterioration, depending on how carefully the matings are made. Intensifying good blood lines by breeding within certain families without inbreeding too closely is desirable in improving production. This mild form of inbreeding is sometimes referred to as line-breeding. Care should be taken not to make radical changes in introducing new blood into well-established, high-producing families. Although most flocks of pigeons used for market-squab production have been culled, very little attention has been given to improvement by careful breeding methods. Introduction of breeding stock from carefully selected flocks bred for squab production would improve these flocks.

Pure breeds, selected and bred for squab production, are generally used for the production of squabs for market. Crossbreeding is used

to some extent in market-squab production. The first cross of two breeds selected and bred for squab production usually produces a very good market squab. Birds from crossbred flocks, however, are not usually the first cross of two carefully selected pure breeds but are the product of continued and indiscriminate crossbreeding.

A simple but accurate system of records, showing the band numbers of each pair, should be kept for each pen. When 7 to 10 days old, the squabs saved for breeders should be banded with numbered seamless bands made of aluminum or plastic. In addition to these bands, colored bands commonly made of celluloid, numbered in duplicate, are put on each pair when the birds are mated, thus making it easy to keep their records. Careful records should be kept of the production of the birds and of the costs of the business. A card should be tacked on each nest showing the band number of the parents, the date the eggs are laid, the date of hatch, the nest bands, weight, and disposition of the squabs. When the squabs are removed these data are transferred to permanent records.

## Hatching and Rearing Squabs

The period of incubation of pigeon eggs is approximately 17 days, but the first squab does not hatch until about 18 days after the first egg is laid. The hen pigeon usually lays one egg, skips a day, and then lays again. The second egg usually hatches a day after the first. If more than two eggs are laid, it is advisable to remove the extra ones, as a pair of pigeons can raise only two good squabs at one time. Both parents build the nest and take turns sitting on the eggs and feeding the young until they are marketed or until they are able to take care of themselves.

When the breeders are producing freely, the hen often lays another setting of eggs after the squabs are from 2 to 3 weeks of age and leaves the feeding of the squabs from then on largely to the male. Double nests are provided for each pair to discourage the hen from laying again in the same nest with the squabs so she will not be disturbed by them during the incubation period.

Squabs are reared and fed by both of the parent birds on a thick, creamy mixture called pigeon milk, produced in the crops of the pigeons. Pigeons usually feed their squabs

shortly after they themselves are fed and should not be disturbed at that time. Care should always be taken not to frighten pigeons, and squabs should not be disturbed any more than is necessary.

In case a squab dies during the first week or 10 days, another single squab may be placed in the nest, provided the two are about the same size. This procedure gives the pigeons without squabs a chance to begin producing again sooner than they would otherwise. It requires from 25 to 30 days for a squab to reach market age, the time varying with the size of the breed. The average market age for Kings and Carneaux is 26 to 28 days.

Squabs that are to be saved for breeders should remain in the pen with the parent birds until from 6 to 7 weeks of age so as to learn to eat and to take care of themselves. They should be removed at this age because they are likely to disturb the breeders if left in the pen too long. The smaller squab in the nest is likely to be the female, so when sav-

ing for breeders do not save only the larger squabs from the nest as this will give a much larger percentage of males among the young breeders.

If the parent birds become sick or die, the young birds may be fed by hand, provided they are at least a week old. Only the smaller grains are used for hand feeding until the squabs are 2 weeks old. The squabs should be fed at least 2 and preferably 3 times a day on grain that has been soaked for about 4 hours. It is dropped into the squab's mouth or fed with a syringe. Enough feed is given to fill but not to stuff the crop.

About 60 percent of the year's production of squabs is during the spring and summer, the proportion falling to 20 to 25 percent during the fall, and to 15 to 20 percent in the winter months. This gradual decline in production is due to the fact that mature pigeons usually molt late in the summer and during the fall.

## Feeding

The feeding of pigeons differs radically from the feeding of other poultry. Pigeons should not be fed mash, and green feed is not necessary. They do not produce well on the ordinary low-protein grain mixtures used for chickens since from 13.5 to 15 percent of protein is necessary for good growth in squabs. A high-protein grain, such as cowpeas, Canada peas, field peas, or garden wrinkled peas, must be used to get the desired protein content. Successful squab production requires diets that produce quick-growing, well-fleshed squabs. As the grains of high-protein content are the most expensive ingredients in the ration, use only as much of them as is needed for good growth.

A good pigeon feed usually contains from 13.5 to 15 percent of protein, 60 to 70 percent of carbo-

hydrates, 2 to 5 percent of fat, and not more than 5 percent of fiber. Minerals are fed in a separate mixture. All these grains furnish thiamine, and yellow corn contains considerable vitamin A, as well as some vitamin E and riboflavin. Wheat is high in thiamine and vitamin E and contains some riboflavin. Peas are a good source of vitamin A and thiamine and also contain some vitamin E and riboflavin which add to their value as pigeon feeds. Garden peas are higher in vitamin A than either Canada field peas or cowpeas. Recent experiments at the California Agricultural Experiment Station indicate that riboflavin and vitamin B<sub>12</sub> supplements increase squab production through increased hatchability.

Proteins are used to build and repair flesh tissue and are essential to

the production of large squabs of good quality. Carbohydrates and fats furnish the energy requirements and supply material for the formation of fat. Pigeons do not utilize fiber to advantage, and the fiber content should be kept below 5 percent. Minerals are needed for good bone growth, for proper balance of the blood, and for the formation of eggshells. Common salt and such elements as calcium and phosphorus are usually deficient in the grains and should always be supplied by the use of a mineral mixture. Clean drinking water is essential for pigeons.

Corn and kafir or milo, used as poultry feed, contain about 80 percent of digestible nutrients, wheat about 73 percent, garden peas, 72 percent; field peas, 66 percent, and cowpeas, 65 percent. Damaged grains, such as soft corn and soft wheat, are usually lower in digestible nutrients than sound, well-matured, well-seasoned grains. Such grains not only contain less feed nutrients but may cause poorer growth in squabs. Good hard, well-seasoned grains are much to be preferred. Cracked grains contain more waste, absorb more moisture, and spoil more readily than the whole grains, and they are not generally used for pigeon feeding.

All pigeon feed should be kept in a dry place, free from weevil infestation. Squabs are much more affected than breeding stock by the use of poor-quality feeds or a low-protein ration. To produce good-sized squabs it is necessary to feed grains that pigeons like and will eat freely.

The selection of the grains to use in a pigeon diet is influenced by the price and availability of the grains and by the results that have been obtained in feeding pigeons. Corn, kafir, peas, and wheat are the grains most commonly used.

A good pigeon feed may be made up as follows:

	<i>Parts by weight</i>
Whole yellow corn-----	35
Kafir or milo-----	20
Cowpeas or field peas-----	20
Hard red wheat-----	15
Oat groats-----	5
Hempseed-----	5
Total-----	100

The composition of this feed in percentages is approximately as follows: Crude protein, 14.2; carbohydrates, 66.9; crude fiber, 2.6; and fat, 2.8. The corn may be reduced to 25 parts during the summer months. For a simpler diet, omit the oat groats and hempseed.

Corn is one of the best feeds for pigeons and is the basis of all diets for this purpose. Yellow corn is the principal source of vitamin A in the pigeon diet; white corn should never be used as it is deficient in this vitamin. Both the flint corn and the yellow dent corn are used. Pigeons will eat the large kernels of dent corn and there is no advantage in paying higher prices for smaller corn or Argentine corn. Soft corn should not be used for pigeon feed. Whole corn is better than cracked corn, unless freshly cracked.

Kafir and milo are hard, dry grains, similar in composition, and are good feeds for pigeons. These grains lack vitamin A, but contain thiamine, riboflavin, and vitamin E and are good grains to feed with corn. Corn and kafir usually constitute more than 50 percent of the pigeon ration.

Peas are the most essential grain in pigeon diets. They are high in protein, furnish desirable vitamins, and are essential to get plump squabs that grow rapidly. Peas, however, are relatively high in price, thus usually are not used to make up more than 20 percent of the diet. Canada field peas are used most commonly, although equally good results may be obtained from cowpeas or garden peas. Cowpeas are usually cheaper in the South than Canada peas. The Brabham, Whip-

poorwill, New Era, and other varieties of cowpeas or a mixture of several varieties have been used with good results. Garden or wrinkled peas are equally good and are used whenever they can be purchased as cheaply as the other kinds.

Peanuts are sometimes used in place of part of the peas but they do not keep so well as peas and are usually higher priced. Raw soybeans are high in protein but do not seem to be desirable for pigeon feeding unless well cooked. It is advisable to change the diet gradually in making use of another high-protein feed, and it may be necessary to let the pigeons get hungry before they will eat the new feed.

Wheat is a good pigeon feed and generally makes up from 15 to 25 percent of most pigeon diets. Good clean well seasoned wheat should be selected for pigeon feeding. Red wheat is the variety commonly used.

Pigeons are very fond of both vetch and hempseed. If they are given free choice of grains they will eat more than 50 percent of hempseed. Hempseed is high in fat and is sometimes added to the feed during the molting period. Vetch seed is low in fat but high in protein. Not more than 5 percent of either of these seeds is used, because of their cost.

The nutrients supplied by all these grains are shown in table 1.

TABLE 1.—Average composition of pigeon feed

Feedstuff	Moisture	Ash	Crude protein	Carbohydrates		Fat, or ether extract
				Crude fiber	Nitrogen-free extract	
	Percent	Percent	Percent	Percent	Percent	Percent
Buckwheat.....	11.9	1.8	10.1	10.4	63.5	2.3
Corn.....	11.9	1.3	9.3	2.1	71.2	4.2
Corn (Argentine).....	11.0	1.7	11.0	1.8	68.8	5.7
Cowpeas.....	11.1	3.5	23.5	4.1	56.3	1.5
Field peas.....	9.3	3.3	23.3	5.9	57.0	1.2
Garden peas.....	11.8	3.0	25.6	4.4	53.6	1.6
Hempseed.....	7.6	5.9	22.9	18.6	18.4	26.6
Kafir.....	11.7	1.6	11.5	2.0	70.1	3.1
Millet (proso).....	9.6	3.4	11.6	8.7	63.1	3.6
Milo.....	11.0	2.0	11.0	2.2	70.9	2.9
Oat groats (ground or rolled).....	10.4	2.6	17.3	1.8	61.3	6.6
Peanut kernels.....	5.4	2.3	30.4	2.7	11.6	47.6
Rapeseed (common).....	7.3	4.2	19.5	6.0	18.0	45.0
Rice (polished).....	11.8	.5	7.5	.4	79.4	.4
Soybeans.....	8.8	4.8	37.9	5.0	26.6	16.9
Vetch seed.....	12.1	2.9	27.5	3.5	52.8	1.2
Wheat.....	11.0	1.8	12.4	2.4	70.5	1.9

A small proportion of other seeds and grains may be used in pigeon diets to add variety. Many kinds are relished by pigeons and may add desirable vitamins and proteins to the diet. Some of these feeds are millet, buckwheat, rice, and rape, but generally not more than 5 percent of any one is used. These grains and seeds are not essential in

a pigeon diet and most of them are too high in price to be economical.

In experiments at the Agricultural Research Center no higher squab production was obtained by adding 5 percent each of 6 of these miscellaneous feeds to the simple ration. Reducing the percentage of peas in the feed materially reduced squab production, thus demonstrat-

ing the necessity of supplying about 20 percent of this high-protein feed.

Commercially mixed pigeon feeds are used extensively in both large and small flocks. The quality of these feeds is usually good, and it is more practical to buy them for a small flock than to mix the ration at home. Dealers often handle 2 or 3 grades of feeds. It usually pays to get a good grade which contains a sufficient quantity of peas and not too large a proportion of corn. The fat, crude protein, carbohydrate, and fiber analyses of these commercial feeds are marked on the bags. Commercial pellet feeds which give satisfactory results are available.

Minerals are an essential part of the pigeon diet, because all the grains and seeds commonly fed are low in minerals. A mixture con-

sisting of a calcium source and salt should be kept in a hopper before the pigeons all the time. There are more complex mineral mixtures available, often called health grits, which are commonly used in pigeon feeding. Workers at the New Jersey Agricultural Experiment Station, however, found that a mineral mixture consisting of 95 percent chick-size oystershell and 5 percent salt gave as good results as a more complex mixture. If pellets are fed, follow the directions of the manufacturer.

A constant supply of clean, fresh drinking water should be provided. If fountains are used, they should be constructed so that the pigeons can drink out of them, but not bathe in them. Running water, which the pigeons may use for both drinking and bathing, is sometimes provided.

## **Feeding Practices**

A self-feeder may be used in feeding grains to pigeons or the grains may be fed by hand twice a day. The use of the self-feeder saves labor and provides ample quantities of feed at all times, but feed left in the pen tends to attract mice. If the breeders are overfed they will get into the habit of eating only their favorite grains and will waste the other feeds; therefore, it is advisable to put only a little over 1 day's supply of grain in the hopper at one time. The hopper should be filled only partially and be so constructed that the birds cannot easily waste the feed.

In feeding the grains by hand the quantity should be limited to that which the birds will clean up within

half an hour. Grain is fed either on the floor or in open troughs, the latter method being more sanitary. Breeding stock should have grain enough so that they can fill up their squabs. Grain left on the floor may spoil, and spoiled grain eaten by pigeons may lead to diarrhea or other troubles.

The self-feeders or the feed troughs may be placed in the center of the pen or in the aisle partition (fig. 7). Check over the aisle feed troughs twice at each feeding and supply just enough grain so that the birds always have a keen appetite but are not underfed. If pellets are used, the common practice is to keep pellets before them at all times.

Squabs are sometimes force-fed after they are 10 to 12 days old, by putting them in batteries and feeding them by some artificial method. Ordinary pigeon feeds are soaked in water for about 4 hours and the squabs are given enough of the liquid feed to fill their crops 2 or 3 times a day. Increased weights may be obtained by this method but it involves considerable extra labor and the squabs have to be fed longer before they are ready for market. Force-feeding has been used to a limited extent in several foreign countries but has not been put into practical use in this country.

The quantity of feed a given number of breeders will eat depends on the weather, on their appetite and

size, and on the number of squabs in the nests. Pigeons consume more feed when they are feeding squabs and they need more grain in cold weather than in warm weather. A pair of high-producing Kings, or of other breeds of that size, will eat 105 pounds of grain in 1 year; a pair of birds of the smaller breeds such as Homers will consume about 90 pounds, and a pair of large Runts, about 125 pounds. On this basis, 100 pairs of Kings would eat an average of about 28 pounds of grain each day. To rear each new pair to producing age requires approximately half as much feed as is consumed by a mature pair in 1 year. It takes from 7 to 8 pounds of feed to produce 1 pound of squab (dressed weight).



77598-B

FIGURE 7.—Open feed hopper with rotating pole at top. Note the open-front nests above feed hopper.



50065-B

FIGURE 8.—A two-pen, backyard pigeon house. Note that perches are arranged along the top of pens and water pans placed in each pen.

## Pigeon Houses

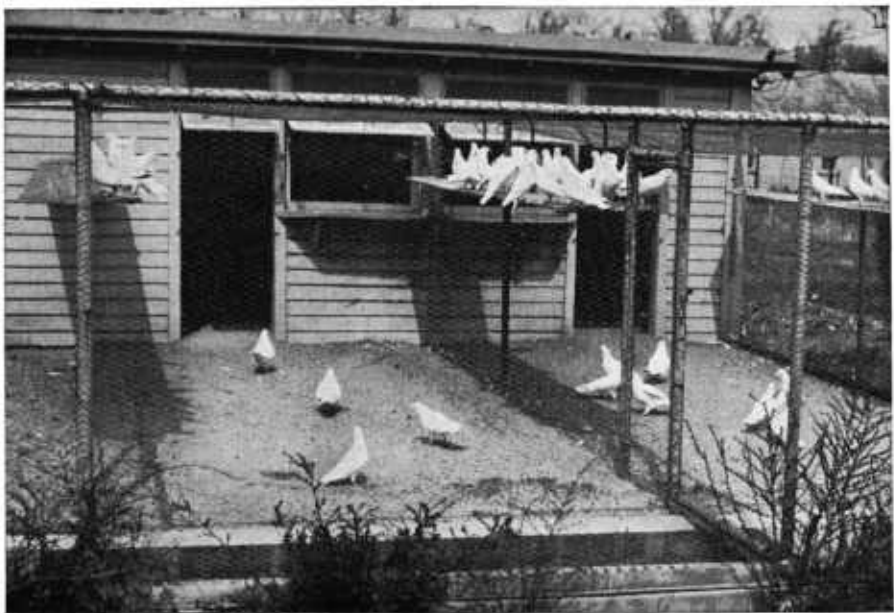
A pigeon house should be planned to keep the pigeons comfortable. For southern or mild sections of the country an open-front house with plenty of ventilation is desirable, while for the colder sections the openings in the front of the house should be adjustable and regulated to the weather conditions. The house should face south and be located on soil which is well drained. Dampness in the pigeon house is likely to cause sickness in the flock. A pigeon house should be made so that it will provide fresh air, sunlight, and space enough to keep the pigeons comfortable. The more sunlight in the house the better, as it helps to dry out the moisture and also helps to keep the buildings sanitary. The house must be free from drafts, and all walls except the front should be closed in cold weather.

The shed-roof house is one of the simplest and cheapest types to build and small houses are usually built about 6 feet high in the rear, 7 to 8 feet in the front, and 9 to 12 feet deep. An 18- to 24-inch projection or hood may be built on the front of the house for protection against storms (figs. 8 and 9). The depth of the house depends on the number of

breeders in each pen and whether or not a separate aisle is included in the rear of the house. If the building contains more than 4 pens, a 3-foot aisle in the rear of the building is advisable to allow the use of a wheelbarrow for cleaning and to permit entrance into any pen without disturbing the birds in other pens. Such a building may be 15 feet deep, with solid partitions 18 feet apart and every other partition of wire to allow more light and ventilation in the pens (fig. 10). This will make the pens 9 by 12 feet and each pen will accommodate from 25 to 30 pairs. This makes a desirable unit for keeping records of breeders. It is difficult to keep accurate records in a larger unit than the one just mentioned.

The house may be made any length desired, depending on the number of pigeons to be housed. On commercial squab farms from 10 to 20 pens are usually kept in one long house (fig. 11). From 3 to 4 square feet of floor space is usually allowed for each pair of pigeons, depending on the size of the breed. Many commercial breeders of the smaller breeds such as the Giant Homers and the Carneaux keep





48062-B

FIGURE 9.—A four-pen pigeon house with partial open front protected by windows, used in Maryland. Similar houses but with open fronts are used in the South. Note bathing trough in foreground.

more than 30 pairs of pigeons in each pen, allowing less than 3 square feet of floor space per pair.

If no aisle is to be put in, the house may be made from 9 to 12 feet deep. Every other partition may be made of wire; this practice makes the house cheaper and the pens lighter. In houses with aisles, the partition next to the aisle may

be made of wire but it should be covered in cold weather to prevent drafts on the birds. The nests are usually placed against the solid sides of each pen.

Other types of houses are used with good results for squab production. For a small flock part of a garage or other building may be used for a pigeon pen. Details of



55026-B

FIGURE 10.—A 6-pen pigeon house with a rear aisle 3 feet wide. This house is 15 feet deep by 54 feet long, 8 feet high in front, 6 feet in the rear with pens measuring 9 by 12 feet.



FIGURE 11.—Hip-roof house with closed front, used in New Jersey.

the construction of poultry houses are given in Miscellaneous Publication 728, "Houses and Equipment for Laying Hens." Pigeon houses are usually built of wood and are of about the same style of construction as poultry houses, except that pigeon houses usually are not built so deep. Costs of buildings must be estimated from local prices of material and labor.

Artificial heat is rarely used for pigeons. Good ventilation must always be provided and the house should be dry. Well-built houses, in which the birds can be kept comfortable in cold weather (figs. 10 and 11), help to increase winter squab production and to reduce feed costs.

Artificial lights are used successfully in pigeon houses and they increase squab production about one-third during winter months when squab prices are highest. However, production may be reduced in the other months so that there will be very little increase for the year. The use of lights from 4:30 a.m. until daylight during the period November 1 to March 1 is suggested.

Pigeon houses should be so constructed that they can easily be kept

free from rats. This may be accomplished by building the house from 18 to 24 inches above the ground, putting in a board floor, and boarding up the space between the ground and the floor, but leaving small doors or openings for ventilation and for cats and dogs to get under the house. If double or insulated walls are built they must be so arranged that they will not harbor rats.

Concrete makes good foundation pillars and concrete floors may be used if covered with 1 or 2 inches of sand. A concrete floor should be built above the outside ground level and over a porous filler of cinders or coarse gravel so that it will be free from ground dampness.

Dirt floors are sometimes used on light, well-drained soil, but are hard to keep clean. Most pigeon raisers prefer wooden floors in pigeon houses.

Information on pigeon houses can be obtained from the California Agricultural Experiment Station, Davis, Calif., and from the New Jersey Agricultural Experiment Station, New Brunswick, N.J.

## Equipment

The interior fittings may consist of a double nest for each pair of breeders, nest bowls, and feed hopper. Double nests are necessary as the female pigeon will usually lay again before the squabs are old enough to leave the nests. The nests are built in rows 4 or 5 tiers high. All interior equipment should be as simple as possible to keep costs low and to facilitate cleaning. (Fig. 12.)

Nest compartments may be 14 inches high, 14 inches deep, and 28 inches wide. When the compartments are divided into 2 nests, these dimensions permit each nest to be 14 inches square and 14 inches high, inside measurements. There should be a 5-inch landing board in front of each double nest, and a 5-inch vertical board at the front of each open nest to keep the nesting material and the squabs from falling



77599-B

FIGURE 12.—Interior of pigeon house showing double nest boxes with wire fronts.

out. Each section may be built on cleats so that it can be easily removed for cleaning. Nest bowls, which make the nests more sanitary and save nesting material, are used on some farms, but these are not essential.

A more expensive type of nest with wire fronts and a 6-inch hinged landing board is shown in figure 12. This nest is 14 by 14 inches and provides good protection for the squabs. Closing the opening permits the nest to be used for mating the birds. Inexpensive nests may be made of egg or orange crates by adding a 5-inch landing platform, a 5-inch vertical strip on the front, and extending partitions at the end of each crate.

Hoppers and feed troughs should be large enough so that all birds can get feed. An open feed hopper 6 feet long, where the birds feed from both sides, is large enough for about 30 pairs of pigeons (fig. 7). With aisle troughs where the birds

can eat only from 1 side, 2 open troughs about 6 feet long, 1 placed above the other, should be provided. Feed waste can be reduced by using wire mesh on the hoppers.

Pigeons like coarse nesting material, for which purpose fine tobacco stems, longleaf pine needles, oat straw, and sagegrass are used. If nest bowls are used, less nesting material is required. The nesting material should be kept in a crate or rack in one corner of the pen to prevent waste.

Pigeons are kept confined by the use of a wire-covered outside fly pen or yard on the south side of the house. For a pen of 25 to 30 pairs, this fly pen should be from 6½ to 7 feet high, about 12 to 15 feet long, and of the same width as the pen. One-inch wire mesh is best for covering the fly as it keeps out sparrows and rats. It is necessary to extend the wire 12 inches into the ground, making a right-angle

bend of 12 inches at the bottom away from the pen to keep out rats. A covering of 3 to 4 inches of sand or gravel makes an ideal surface for the outside pen, as this drains freely and is easily cleaned. Boards on which the pigeons can light should be placed at the bottom of the pigeon hole unless the opening extends to the floor. Landing boards about 8 inches wide are placed on the side of the pen, as shown in figures 8, 9, and 10.

Bathing facilities should be provided in the yards so that the pigeons can bathe daily. Water for bathing helps to keep the pigeons in good health and free from insect pests. A galvanized pan about 5 inches deep and from 15 to

20 inches in diameter makes a good bath pan (fig. 8). The pigeons will drink the bath water, therefore if these pans are left in the yards they should be filled twice a day with fresh water. If covered fountains are used for the drinking water, the bath pans are used only for 2 hours every morning. Long concrete troughs for both watering and bathing are usually placed at the end of the yards. The trough should be 5 inches deep and 2 feet wide and should extend the width of the fly, with a drain in the lower end. The water in the trough should be changed twice a day. It is very important to keep all water utensils clean and to keep the pigeon house absolutely dry.

## Sanitation

Pigeons can be raised successfully only when the pens and yards are kept clean and the birds are kept free from disease and insect pests. If one begins with healthy stock and gives it proper management there should be no serious disease.

On the other hand, crowded houses, poor feeding, damp or poorly ventilated pens, lack of cleanliness in the pens and yards, and careless selection and breeding of the stock may lead to heavy losses in the flock. It is much easier to prevent than to cure disease.

The house should be kept dry, clean, well-ventilated, and free from drafts. The floor should be covered with about 1 inch of sand or sawdust and the droppings should be raked off frequently. The outside yards are usually surfaced with sand or gravel and should be kept clean by scraping the surface and adding fresh material. In all cases the yards should be well drained and

higher than the natural ground level.

The pens should be cleaned at least once a month, but nests that contain eggs or very young squabs should not be disturbed. The nest or nest bowls should be cleaned and the nesting material removed whenever the squabs are marketed or leave the nest. Twice a year the entire pen should be thoroughly cleaned out. The cleaning should include scraping the floor and nests and then washing with lye water. A disinfectant or whitewash containing a disinfectant or lye should be sprayed freely over the entire interior of the pen. A 3-percent creosol solution (one-half pint of compound solution of creosol mixed with 8 quarts of water) is a good disinfectant. Examine the nest boxes and landing boards for mites, especially in hot weather, and if any are found, the boxes and landing boards should be sprayed with crude oil or carbolineum thinned with

kerosene, used engine oil, or creosote oil. If the pigeons have lice on their bodies and wings they should be treated with malathion, either by

dusting with a 4-percent malathion dust or by spraying with a solution containing 0.5 to 1 percent of malathion.



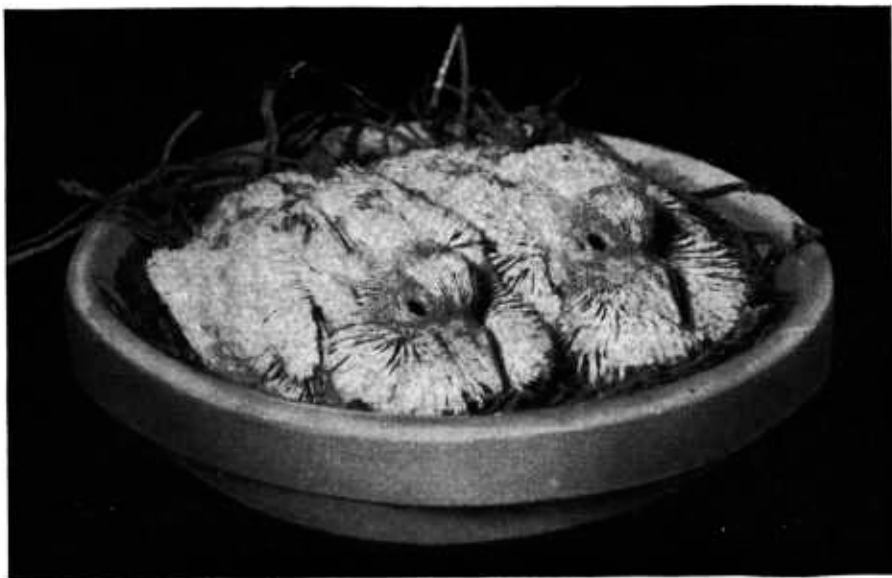
FIGURE 13.—Squabs 48 hours old.

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FIGURE 14.—Squabs only 8 days old but several times larger than when hatched.

77488-B



77489-B

FIGURE 15.—Squabs 2 weeks old and still growing rapidly.

## Manure

Dry pigeon manure may be sold for fertilizer to market gardeners, fruit growers, and florists in some localities, but it is more commonly used at home. As it is rather rich, it has considerable value as a fertil-

izer and should be mixed with dry dirt or some filling material before it is used. Artificial preparations have replaced the use of pigeon manure for tanning purposes.

## Causes of Death of Squabs

Pigeons are subject to many of the diseases that affect other poultry and they may be treated in much the same manner. Information on treatment of poultry diseases and control of parasites may be obtained from the U.S. Department of Agriculture, Washington, D.C. 20250. Roup, pox, and canker, which affect the head and throat, are common pigeon diseases although tuberculosis, coccidiosis, and paratyphoid sometimes cause heavy losses. Birds affected with the latter diseases gradually grow thin and waste away. Most of the

diseases mentioned are contagious, and their spread is favored by insanitary conditions, dirty drinking or bathing water, and poor feeds. Birds having infectious diseases should be killed and the carcasses burned and the management conditions improved. Potassium permanganate used at the rate of one-third teaspoon to each gallon of drinking water serves as a mild antiseptic.

Losses are much greater in squabs than in mature stock. Losses may be caused by taking away squabs to be raised for breeding before they

have learned to eat grain and to take care of themselves. The squabs will usually leave the nests during the fifth week but should be fed by their parents until they are 6 to 7 weeks old. Some squabs are pecked to death by the older pigeons, especially when there are unmated pigeons or extra males in

the pens. Lack of vigor in the breeding stock, owing to careless breeding, to poor management, or poor feeding, may cause losses among the squabs. The first requirements of success in raising squabs are selection of good breeding stock and keeping the pigeons free from disease.

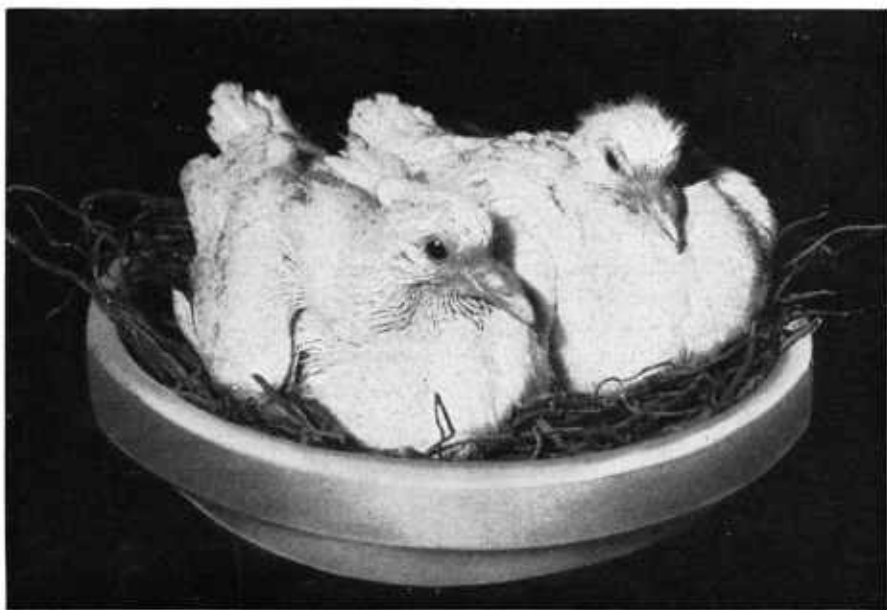
## Marketing Squabs

Dealing directly with consumers, such as hospitals, hotels, country clubs, high-class restaurants, and similar trade is usually the best way to market high-quality squabs. There is a specially good demand for squabs from the Jewish, Chinese, and Italian trade in the larger cities, and much of this demand is for live squabs, whereas practically all other classes of trade require dressed squabs. The majority of squabs are sold to wholesale dealers in the large cities, since they will take any

number of squabs at a time although at prices lower than retail.

The price paid for dressed squabs varies with their size and quality, the season of the year, and the market location. Some markets quote squabs at so much per pound and others at so much per dozen, the prices varying according to the weight of the squabs.

Prices of freshly dressed squabs are more closely associated with available supplies than prices of frozen squabs. Production is high-



77490-B

FIGURE 16.—Squabs 3 weeks old. (Squabs 4 weeks old are shown on cover page.)



77491-B



77493-B

FIGURE 17.—Left: Squab showing pinfeathers on underside of wing; not quite old enough for market. Right: Squab 4 weeks old; ready for market and fully feathered under the wing.

est in spring and summer, lower in the fall, and lowest in the winter. Small and dark-skinned squabs bring lower prices, and extra large, attractive squabs bring slightly higher prices than the average market price.

Information about current prices of squabs may be obtained by writing to Consumer and Marketing Service, U.S. Department of Agriculture, Washington, D.C. 20250.

Squabs grow very rapidly and are marketed when fully feathered under their wings, which is from 25 to 30 days of age, depending on the size of the breed. Kings, or breeds of that size, are usually ready for market when 26 to 28 days old. Squabs at various ages are shown

in figures 13 to 17. They must be sold just as soon as they are ready for market (see cover page) because they soon lose their baby fat, and their flesh begins to get hard.

Market squabs may be gathered from the nests the evening before they are to be killed. The crops then will be empty when the birds are dressed. If there is any feed in the crops after the birds are killed, it should be flushed out. Many large producers prefer to flush the crops rather than to withhold feed. Dressed squabs with full crops bring lower prices than those with empty crops.

The usual method of killing squabs is to hang them by the feet on a hook or nail, and cut the jugu-



lar vein in the mouth just below the base of the skull, using a knife with a long slender blade. They may then be placed head down in open metal cones for bleeding, to keep the birds from flapping their wings.

Squabs should be dry-picked immediately after they are killed, because the feathers are very hard to pull out if the birds are allowed to get cold. Squabs may be picked on a bench, or held in the lap instead of being hung up on a hook. They should be picked clean except for the feathers on the head. All pinfeathers should be removed. The skin of a squab is so tender that it tears and bruises easily. Between 13 and 14 percent of the weight is lost by removal of feathers and blood.

After the squabs are killed and picked, they are washed and cooled promptly in cold water to remove all body heat. If piled up before cooling, or if the water is not kept cold, the dressed squabs will not keep properly and the skin will blister and discolor. It takes from 2 to 3 hours to cool squabs in cold water, and the birds then should be taken out because they become soft if left in too long. Squabs not properly cooled at killing time never make first-quality birds, no matter how well they are chilled later. In cold weather, take care to see that the dressed birds do not freeze.

Dressed squabs should be graded and then packed in a tight clean box, tub or small barrel that has holes in the bottom for drainage. Line the container with clean heavy paper and place a thick layer of cracked ice in the bottom. Pack the squabs, heads down, on this layer of ice with their breasts outward, leaving a little space around the edge of the container for ice. Use alternate layers of squabs and ice, and cover the top with a thick layer of coarsely cracked ice over which burlap or several layers of heavy paper are placed. Use enough ice to keep till the squabs get to their destination. Boxes are

made for packing either 12 or 24 squabs. If too many squabs are packed together, those in the lower layers are likely to become bruised. Squabs may be wrapped individually in parchment paper, which makes an attractive package that can be used to advertise the brand of squabs.

The squabs should be shipped to market promptly so that they will arrive in good condition. Most express companies will allow 25 percent off the gross weight for ice packing on shipments of dressed squabs if this discount is requested when the shipment is made. It is necessary to have a good-sized flock of pigeons to furnish enough squabs at one time to pay to make express shipments. Local trade that will take small lots of squabs is a great help to the small producer. In spring and summer when squabs are most abundant and squab prices are lowest, some producers put their dressed squabs into cold storage and hold them for sale during the winter.

Squabs may be supplied to the consumer ready for cooking if they are eviscerated and quick-frozen after slaughter. They may be held in a frozen condition from midsummer when prices are low to midwinter without apparent loss of flavor. Removal of feathers, blood, and viscera constitutes an average of 26 to 27 percent of loss from live weight.

In shipping live squabs, a crate divided into 2 or 3 sections is used, or the squabs may be shipped in small boxes, about 12 squabs being placed together. With larger numbers there is danger of some of the birds being smothered. Shallow crates or boxes not over 8 inches deep help to keep the squabs from piling together and injuring one another. The live squabs are collected from the nests after feeding time and shipped promptly so that their crops will be full when they are shipped. No feed or water is supplied for shipments going short distances.